Take Care Of Home And Family, Honey, And Let Me Take Care Of The Money. Gender Bias And Credit Market Barriers For Female Entrepreneurs

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‘Take care of home and family, honey, and let me take care of the money.’ Gender bias and credit market barriers for female entrepreneurs

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‘Take care of home and family, honey, and let me take care of the money.’ Gender bias and credit market barriers for female entrepreneurs

Abstract

We identify the causal effect of gender bias on access to finance. We extract an exogenous measure of gender bias from survey responses by descendants of US immigrants on questions about the role of women in society. We then investigate a detailed dataset on small business firms from 17 countries and find that the inherited component of gender bias is associated with gender-based discrimination in the credit market of the immigrants' country of origin. In particular, in countries with higher gender bias, female-owned firms are more frequently discouraged from applying for bank credit and are more reliant on informal finance.

JEL classification: G21, J16, N32, Z13.

Keywords: Cultural bias; Gender-based discrimination; Female-owned firms; Credit supply.

A woman cannot be herself in the society of the present day, which is an exclusively masculine society, with laws framed by men and with a judicial system that judges feminine conduct from a masculine point of view.

Henrik Ibsen, *Ibsen's Workshop*, 1912

1. Introduction

Economic research has focused intensely in recent years on the link between culture – which Guiso, Sapienza, and Zingales (2006) define as *the customary beliefs and values that are transmitted fairly unchanged from generation to generation* – and economic outcomes. Scholars have provided strong evidence that various beliefs and preferences, rooted in the cultural experience of economic agents, are related to a range of economic phenomena, ranging from growth (Knack and Keefer, 1997) and financial development (Guiso, Sapienza, and Zingales, 2004), to trade (Guiso, Sapienza, and Zingales, 2009) and regulation (Aghion, Algan, Cahuc, and Shleifer, 2010).

Having established a robust correlation, the research effort has turned to identifying the causal impact of culture on economic outcomes. Doing so requires taking two crucial steps. First, one needs to show that a narrow subset of the entire range of cultural beliefs and preferences has a directly measurable impact on a specific economic phenomenon. Second, one needs to show that not only the contemporaneous component of these beliefs and preferences, but also their predetermined component, has an impact on the economic outcome in case.

This paper aims to take both steps concurrently by investigating the impact of a well-defined cultural belief – i.e., the belief that women are inferior to men, or the "gender bias" – on a well-defined economic outcome – i.e., access to external finance. More specifically, we investigate the impact of the gender bias on the credit market experience of female versus male firm-owners. We first study whether, compared to male firm-owners, females: (1) are more often denied credit; (2) are more often discouraged

from applying for credit; (3) rely less on bank credit and more on alternative sources of finance, such as trade credit, in the financing of the operations of their firm; and (4) are offered inferior loan terms. Second, we investigate whether these practices are stronger in countries with a stronger gender bias.

Establishing a causal link from gender bias to credit market outcomes is at the heart of our paper. To extract the predetermined component of the gender bias across our sample countries, we borrow the empirical strategy from Algan and Cahuc (2010) who employ information on cultural attitudes of US-born descendants of European immigrants to extract measures of inherited trust and investigate its effect on economic growth. We focus on answers provided by U.S. descendants of European immigrants to survey questions about the proper place of women in society. For instance, we compare Americans of German, Polish, or Russian origin whose ancestors immigrated to the US in 1960. Since it is well established that social capital is transmitted from parents to children (Putnam, 2000; Guiso, Sapienza, and Zingales, 2006), the degree of the gender bias of a person born in the U.S. that has parents that were born in Russia is a good proxy for the degree of gender bias of his parents, and by extension a good proxy for the predetermined component of gender bias in contemporaneous Russia.

This measurement strategy allows us to isolate the inherited component of the gender bias for 17 European countries. Our measure of inherited gender bias is clearly superior – in a causal sense – to similar measures that are commonly extracted from contemporaneous surveys of cultural attitudes in these countries, such as the World Values Survey. Next, we match our country-specific proxy for gender bias to information on the credit market experience by 5,905 firm-owners – 4,193 males and 1,712 females – in these countries, and test whether variations in inherited cultural biases are mapped into variations in access to bank credit and in the terms on granted loans. We focus on small individually owned or family owned firms to make sure that if one of the owners of the firm is female, she has actual influence in the firm's decisions.

We find that cross-country differences in gender bias explain a substantial proportion of the variation in access to credit by female firm-owners, but not in the loan terms of the ultimately successful loan applications. In particular, in countries with a higher inherited gender bias relative to the base country – Poland – and comparing female owners to male owners, the former group of owners: 1) more often do not apply for a loan because they believe they will not get one, and 2) finance a lower portion of their firm's operating expenses with bank credit and a higher portion with trade credit. However, for granted loans, we find no differences in rates, collateral requirements, or the negotiation time involved. The evidence thus implies that the negative effect of gender bias in credit markets is transmitted through more restricted access to credit rather than through a higher price of credit. Our results are observed even when country fixed effects (which capture all time-invariant country variation within the high versus low gender-bias group), a wide range of firm-level characteristics, and a nearly exhaustive set of characteristics capturing the national business environment are included. Overall, our evidence is consistent with Cavalluzzo, Cavalluzzo, and Wolken (2002) and Muravyev, Schäfer, and Talavera (2009) who find that female-owned firms are less likely to apply for and/or to obtain bank credit than male-owned firms, both in the US and in an international context. However, to our knowledge, our paper is the first to make the empirical link between gender, economic outcomes, and *gender bias*.

This paper's results are robust to one potentially confounding influence. In particular, a higher gender bias can over time trigger changes in the skill composition of the labor force through the selection of workers into education or employment, or through migration, for instance (Mulligan and Rubinstein, 2008). One potential implication is that in countries with high gender bias, female firm-owners' set of skills required to run a firm could be inferior. If banks know this, they would be rationally rationing female-owned firms in the credit markets, and so the line between statistical and taste-based discrimination would be blurred. However, we verify that there is no statistical difference in firm growth between female-owned and male-owned firms. Even stronger than that, we show that in high gender-bias countries, there is no statistical difference in growth

rates between *constrained female-owned* firms and *unconstrained male-owned* firms. We therefore argue that our estimates indeed pick up the effect of taste-based discrimination rather than the rationing of potentially inferior projects by banks in countries with a pronounced gender bias.

We are not the first to analyze the impact of cultural beliefs and preferences on economic outcomes. Putnam, Leonardi, and Nanneti (1993) show that social capital is a good predictor of government performance across Italian regions. Guiso, Sapienza, and Zingales show that trust in society affects phenomena like entrepreneurship (2006) and trade (2009). Algan and Cahuc (2009) and Aghion, Algan, and Cahuc (2011) analyze the relationship between trust and institutions and find that, in general, countries whose citizens trust each other less tend to put in place more restrictive institutions. Aghion, Algan, Cahuc, and Shleifer (2010) explain this result by arguing that distrust increases the public demand for government intervention whereas regulation in itself discourages the formation of trust. Tabellini (2008) analyzes the role of culture on the per-capita-income of European regions by using institutional history and literacy rates as an instrument for contemporaneous trust. Algan and Cahuc (2010) use the inherited trust of US immigrants to uncover the causal effect of trust on economic growth. We borrow their identification strategy, i.e., the use of the cultural attitudes of U.S.-born descendants of non-U.S. born ancestors to extract the predetermined component of culture in the ancestral countries. Our intended contribution to this body of work is that we look at gender bias rather than at trust, and try to uncover one of the mechanisms through which culture affects economic growth, namely, through the differential access to credit.

The second related strand of the literature analyzes the relation between well-defined characteristics of the credit market and various social outcomes. Garmaise and Moskowitz (2006) show that bank mergers result in substantially higher property crime rates, because lower access to finance depresses local economic growth and raises the relative benefit of illegal activity. Beck, Levine, and Levkov (2010) show that bank deregulation is associated with a tighter distribution of income, though in their case it is not the access to credit but the increase in the relative demand for low-skilled workers

due to stimulated entrepreneurship and increased education that boosts incomes in the lower part of the income distribution. While we do not explore the link between the structure of the credit market and economic outcomes, our work is naturally related to these studies in that we study how gender bias is transmitted into entrepreneurship through the channel of bank lending.

Our paper also relates to the literature on taste-based discrimination pioneered by Becker (1957). This literature has focused mainly on the labor market consequences of various physical attributes. For example, Hammermesh and Biddle (1994) and Mobius and Rosenblat (2006) find that physical beauty has a positive effect on earnings. Cawley (2004) finds that obesity lowers the wages of white females. Persico, Postlewaite, and Silverman (2004) and Case and Paxson (2008) establish a robust effect of height on earnings, the latter through the channel of higher cognitive abilities. Johnston (2010) finds a substantial female wage premium from being blonde. Various authors have looked into the effect of discrimination – as well as of its interaction with various market developments - on the white-black wage gap (Neal and Johnson, 1996; Rodgers and Sprigs, 1996; Bertrand and Mullainathan, 2004; Carneiro, Heckman, and Masterov, 2005; Charles and Guryan, 2008; Levine and Rubinstein, 2011).

Conceptually similar to our study is the research on the effect of discrimination on the male-female wage gap (Bayard, Hellerstein, Neumark, and Troske, 2003), and on female market participation (Goldin and Rouse, 2000), among others. This research in general confirms the existence of a sizeable earnings gender gap. For example, controlling for education, experience, personal characteristics, city and region, occupation, industry, government employment, and part-time status, Altonji and Blank (1999) find that only about 27 percent of the gender wage gap is explained by differences in observable characteristics. We argue that the difference in income between females and males can be related to cultural beliefs, with access to credit being one channel through which the gender bias depresses the earnings of women in society. To our knowledge, ours is the first paper to test for a direct link between the *predetermined cultural component* of gender discrimination and a well-defined economic outcome.

Most related to our paper is the empirical research on gender and credit market outcomes. Using US data on small businesses, Asiedu, Freeman, and Nti-Addae (2012) find that while race is a significant predictor of both access to credit and the cost of credit, gender is not. Belluci, Borisov, and Zazzaro (2010) find that female firm-owners in Italy face tighter credit constraints when dealing with one individual bank, even though they do not pay higher interest rates. Using the Italian Credit Registry, however, Alesina, Lotti, and Mistrulli (2013) find that after controlling for entrepreneurial risk, female borrowers do pay higher rates, especially when their guarantor is a female too. Using a large cross-country sample, Muravyev, Schäfer, and Talavera (2012) find that female firm owners are more likely to be denied bank credit and that they tend to pay higher rates on bank loans, while for a number of Sub-Saharan countries Aterido, Beck, and Iacovone (2011) find no evidence of gender discrimination. The first three papers use data from one country only and so unlike ours are unable to relate access to credit to the variation in cultural biases across countries. Relative to the latter two papers, we are not only able to link gender to credit outcomes in an international context, but also to investigate the effect of gender bias on that link.

The paper is organized as follows. Section 2 presents the data. Section 3 discusses our identification strategy. Our estimates of the effect of inherited cultural biases on credit market outcomes are presented in Section 4. Section 5 concludes.

2. Data

In this section, we discuss the various data sources used in this paper.

A. General Social Survey

Our measure of the inherited gender bias is constructed using data on U.S. born descendants of non-U.S. born forebears. The information itself is provided by the General Social Survey database (GSS). The database covers the period 1972-2010. The data contains a range of demographic characteristics, such as age, gender, religion, marital status, education, and employment status of the respondents. Importantly for our

purposes, it provides information on the birthplace and the country of origin of the respondents' forebears since 1977. The respective GSS variable "ETHNIC" is defined as the answer to the question: "From what countries or part of the world did your ancestors come?" The countries of origin cover almost all European countries, alongside Canada, Mexico, India, and Africa (an aggregate category). We use information on U.S. citizens whose ancestors came from abroad, regardless of when they came to the U.S.

Our proxy for gender bias is derived from the variable "FEFAM" which is defined by the answer to following question: "*It is much better for everyone involved if the man is the achiever outside the home and the woman takes care of the home and family*." The answers are given on a scale from 1 to 4. From these answers, we construct a variable "Gender bias" that is equal to 1 if the respondent answered "Strongly agree" or "Agree", and equal to 0 if the respondent answered "Disagree" or "Strongly disagree". There are a total of 20,992 responses in the GSS, of which 8,715 (41.5 percent) responded "Strongly agree" or "Agree", and 12,277 (58.5 percent) responded "Disagree" or "Strongly disagree".[1] 6,472 of those respondents come from 17 countries that overlap with the countries in our firm-level dataset which we describe next.

B. Firm-level data

Our firm-level data come from the 2004/2005 wave of the Business Environment and Enterprise Performance Survey (BEEPS), administered jointly by the World Bank and the European Bank for Reconstruction and Development (EBRD).[2] We exclude data from other waves of this survey as they do not provide comparable information on credit access. The 2004 and 2005 BEEPS surveyed 9,655 firms from 27 countries in eastern

[1] Algan and Cahuc (2010) use an identical strategy to extract the predetermined component of trust from GSS answers on the question whether people in general can be trusted.

[2] For a detailed discussion of the data, see, e.g., Brown, Ongena, Popov and Yeşin (2011), Popov and Udell (2012), and Ongena, Popov and Udell (2013).

Europe and central Asia, and 4,453 firms from 5 Western European countries, respectively. We narrow this sample down to 17 countries for which we also have GSS data.[3] In addition to that, we exclude all firms that are not sole proprietorships. This allows us to focus on small individually- or family-owned firms. In this way, we make sure that if one of the owners of the firm is female, she has actual influence in the firm's decisions. The number of firms that report all the information we require for this study ranges from 141 in Bosnia, Croatia, and Lithuania, to 763 in Poland.[4]

B.1. Credit access

To measure credit access by the firm we employ four different measures. We employ the self-reported *Share working capital financed with bank credit* and the *Share working capital financed with trade credit* as two direct measures of "past" access to credit. The survey questionnaire also includes three questions about firm financing which allow us to further describe firms' current access to credit. Firms are first asked if they have a loan or not. Those firms without a loan are then asked in Q47a whether they (a) did not apply for a loan or (b) applied for a loan, but the application was turned down or (c) have a loan application pending.[5]

Those firms that did not apply for a loan are then asked in Q47b to list the main reasons why they did not do so. To this question there are multiple possible answers: (a)

[3] Unfortunately, due to the geographic scope of the survey, we are missing information from many European countries that were pioneers in women's rights, such as the Scandinavian countries.

[4] The survey aimed to achieve representativeness in terms of the size of firms it surveyed: Roughly two thirds of the firms surveyed are "small", i.e., they have less than 20 workers. By design the survey only covers established firms, i.e., firms which have been in business for at least three years. This implies that our sample does not allow us to examine credit access for really young or start-up firms. Moreover, our results are subject to sample selection, in the sense that we only observe firms which had sufficient internal or external funds to survive for at least three years.

[5] Despite the care by the surveyors to solicit the correct answers, it is not entirely impossible that males underreport past loan rejection or application discouragement more than females. Yet it seems rather unlikely to us that the (mis-)reporting of the shares of working capital would be gender-specific.

The firm does not need a loan, (b) application procedures are too burdensome, (c) collateral requirements are too high, (d) interest rates are too high, (e) informal payments are necessary, or (f) the firm did not think their application would be approved. From the above questions we establish our two indicators of current credit access. The variable *Firm discouraged from applying for a loan* is a dummy variable which equals 1 for those firms which did not apply for a loan, listing (b), (c), (d), (e), or (f) as a potential reason. For all firms which did apply for a loan, or did not apply because of reason (a), the variable equals 0. The variable *Loan application rejected* is a dummy variable which equals 1 for those firms which applied for a loan but their application was turned down, and equals 0 for those firms which applied for a loan and have a loan. Firms with pending applications (i.e., less than 1 percent) are treated as missing.

< Insert Table 1 here >

Table 1 presents summary statistics for our indicators of past and current credit access by country. The table shows that there are substantial cross-country differences in credit access across the countries in our sample. For instance, while only 4 percent of the average Russian firm's working capital is financed with bank credit, in Ireland bank credit accounts for almost a quarter (24 percent). The fraction of firms that are discouraged from applying for a loan varies between 2 percent in Ireland and 53 percent in Macedonia. The cross-country variation in loan rejection rates is similarly substantial, with 1 percent of loan applications rejected in Bosnia versus 16 percent in the Czech Republic. In general, loan rejections rates appear low, suggesting that in our sample, restriction in access to finance happen mostly in the dimension of discouragement, and that firms apply for a loan only when they are reasonably certain that their application will not be rejected.

The availability of data on discouraged firms is one of the main strengths of the BEEPS, allowing us to separate firms that did not apply for a loan because they do not need one from those that did not apply although they need one. The reasons for not applying for a loan vary widely across countries in Eastern Europe. The share of firms

which do not apply because they do not need a loan varies from 47 percent in Yugoslavia to 81 percent in Slovenia. The share of firms that are discouraged by burdensome procedures varies from 2 percent in Slovakia to 16 percent in Macedonia. Whereas only 1 percent of firms in Estonia feel discouraged because they anticipate rejection, this share is 10 percent in Lithuania. In addition to that, discouragement may signal an actual rejection if firms decide not to file an application after an informal conversation with the loan officer (see Duca and Rosenthal, 1993).

B.2. Loan terms

Alongside variables describing various aspects of credit availability, we make use of a number of variables that describe the terms of granted bank loans. Firms with outstanding bank credit provide many details on their most recent loan. In particular, firms in BEEPS are asked about the loan rate, the maturity, the currency denomination, the collateral requirements, and the time it took to negotiate the last bank loan.

< Insert Table 2 here >

Table 2 provides the sample summary statistics by country for the most relevant loan characteristics. In the full sample it takes an average of 19.5 days to negotiate a loan, but only 8 days in Spain and more than a month in the Czech Republic and in Slovakia. The overwhelming majority of loans in all countries are collateralized, but there is great deal of variation, with the share of collateralized loans ranging from 56 percent in Greece and Slovenia to 95 percent in Bosnia and Macedonia. Collateral itself averages 149 percent of the loan. In euro area countries, at most 2 percent of the loans are in foreign currency compared to 45 percent in Macedonia. Finally, the nominal average annualized rate of loans is 985 basis points, ranging from 474 basis points in Ireland to 1,794 basis points in Romania.

B.3. Firm characteristics

Recent empirical research by Brown, Jappelli, and Pagano (2009), Brown, Ongena, and Yeşin (2009), Brown, Ongena, Yeşin, and Popov (2011), Popov and Udell (2012), and Ongena, Popov, and Udell (2012) using the BEEPS data, and by Chakravarty and Xiang (2009) using the similar Investment Climate Survey data, has shown that firm size, ownership, activity, product market competition, accounting standards, bank use and internal financing, and obstacles to doing business affect credit access and credit terms.

Following the above literature we relate our indicators of credit access to firm-level indicators of firm size (*Small firm*, *Medium firm*, and *Large firm*), privatization history (*Originally private*), export activities (*Exporter*), the number of local product market competitors of the firm (*Competition*), access to government subsidies (*Subsidized*), and accounting standards (*Audited*). We further feature an indicator of the sector in which the firm operates (by SIC 1-digit). Crucially, we incorporate information on the firm owner's gender (*Female*).

< Insert Table 3 here >

The definitions of these firm-level variables are provided in the Appendix. Summary statistics for our firm-level variables are presented in Table 3. The table shows substantial cross-country variation within our sample in terms of ownership by gender. For example, fewer than 1 in 5 firms in Macedonia, Slovakia, and Spain have a female owner, while 1 in 2 in Portugal does. Apart from that, the average firm in our sample is small, originally private, has no access to foreign product markets, receives no subsidies from local or central governments, and does not have its financial statements certified by an external auditor.

C. Country-level data

As in Pistor, Raiser, and Gelfer (2000), de Haas and Lelyveld (2006), Giannetti and Ongena (2008), and Brown, Jappelli, and Pagano (2009), we pay attention to how access

to credit may be determined by market and institutional characteristics. In particular, we relate access to credit and loan terms to foreign ownership in the banking sector, to credit information sharing, and creditors' rights, as well as to various macroeconomic and financial developments.

< Insert Table 4 here >

Table 4 presents summary statistics for our country-level variables. Unsurprisingly, foreign bank ownership is very low in countries with large domestic banks (like Germany and Spain) and very high in eastern European countries which underwent bank privatizations in the 1990s. Western European countries which have large and developed financial sectors and are euro area members also have the highest private credit/GDP ratios, the highest degree of information sharing, the highest GDP per capita, and the lowest inflation. Conversely, Eastern European countries have on average higher GDP growth rates, although the highest growth rates in the sample are in Greece and Ireland.

The central variable in our study is the country-specific gender bias. The variable is calculated using the answers by descendants of European immigrants in the US to the GSS question on the role of women in society (see Section 2.A). We describe the estimating procedure we employ to calculate this variable in the next section, but the general idea is that after controlling for a variety of demographic characteristics, we interpret the coefficient on the country-of-origin fixed effect as the inherited gender bias. In an OLS context, this gender bias is calculated *relative* to a reference country. We choose that country to be the median one, namely Poland. As Table 4 makes it clear, being a descendant of parents coming from the countries in former Yugoslavia results in a higher gender bias than being the descendant of Polish parents, while being a descendant of, for instance, Irish parents results in a lower gender bias.

3. Identification strategy

In this section, we discuss the construction of our measure of country-specific inherited gender bias, as well as the identification strategy.

A. Inherited gender bias

The construction of the country-specific measure of gender bias is based on the GSS. To simplify things, we do not focus on one particular generation, but take the answers of all respondents in the survey, regardless of what generation immigrants they are. Thus, inherited trust in 2005 corresponds to the trust inherited by U.S.-born children of European immigrants, born at any point after 1910.[6]

< Insert Table 5 here >

Table 5 reports the OLS estimates of the gender bias for the full sample.[7] The gender bias of Polish-Americans is used as the reference group. The regression includes country-of-ancestry dummies, whose estimated coefficients are then used as the country-specific proxies for the gender bias. In addition to those, the regression controls for a host of individual-specific characteristics: Age, age squared, education, gender, religion, employment status, and income. The total number of observations for which data is available on all relevant variables is 6,472.

The results imply that the gender bias increases with age and decreases with education. Males have a higher gender bias, and so do both Protestants and Catholics (relative to the reference group, which is comprised of atheists, Muslims, Hindus, native-Americans, Christian-orthodox, Judaists, and other). Both employed and unemployed persons have a lower gender bias relative to the control group (which is comprised of retired, in school, keeping house, and other). Finally, respondents with a higher income have a significantly lower gender bias.

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[6] Paulson and Osili (2008) show that the ancestral beliefs of U.S. immigrants decline over time, suggesting that gender bias may be more pronounced for U.S. citizens who immigrated to the U.S. more recently. We perform tests using the latest wave of immigrants only, and our results are robust to this alternative measurement of the inherited gender bias.

[7] The probit regression yields similar results.

Turning to the countries in our sample, the lowest gender bias in our sample – all else equal - is exhibited by the descendant of immigrants from Ireland, who are 7.8 percentage points less likely to agree that "*it is better if the man pursues a professional career and the woman takes care of the house and family*" than the descendants of the immigrants from Poland (the reference country). At the other extreme, descendants of the immigrants from Yugoslavia are 17.1 percentage points more likely to agree with this claim than the reference country descendants. We match the coefficient on the Yugoslavia dummy to all five countries in the sample that by 2005 former Yugoslavia had broken into (i.e., Bosnia, Croatia, Macedonia, Slovenia, and Yugoslavia, comprised of Serbia and Montenegro). We also assign the estimate on the Czechoslovakia dummy to both the Czech Republic and to Slovakia.

In general, we find that 7 countries have a lower gender bias than Poland, namely, the Czech Republic, Germany, Ireland, Lithuania, Portugal, Russia, and Slovakia. In future tests, we pool these countries into the group of "Low gender bias" countries. The rest of the countries, including Poland, we classify as the "High gender bias" countries.

B. Empirical strategy

In order to tease out the causal effect of culture on credit market outcomes, we estimate a simple model where we relate credit access and loan characteristics to our measure of inherited gender bias, as well as to a host of firm-level characteristics that may capture aspects of the demand for and the supply of credit. Specifically, we estimate the following two models:

$$Credit\_access_{isc} = \beta_1 Female_{isc} + \beta_2 X_{isc} + \beta_3 \Delta_{sc} + \varepsilon_{isc} \quad (1)$$

and

$$Loan\_term_{isct} = \beta_1 Female_{isct} + \beta_2 X_{isct} + \beta_3 Y_{ct} + \beta_4 \Delta_{sct} + \varepsilon_{isct} \quad (2)$$

In model (1), we evaluate the effect of the gender of the owner of firm *i* in sector *s* in country *c* on the probability of being rejected or discouraged in credit markets, as well as on the share of capital financed from bank versus non-bank sources.[8] The equation controls for firm (*X*) characteristics, and it includes sector and country fixed effects (Δ_{sc}). These effects control for any market and/or sector unobservables that are common across all firms.

In model (2), we evaluate the effect of gender on the terms of granted loans (days to negotiate the loan, collateral, currency denomination, loan rate). Although there is only one loan per firm, this regression has a panel component because loans were received at different points in time, which allows us to control for the time-varying component of the various country-level developments (*Y*). The regressions also include different combinations of country, industry, and time fixed effects.

In the two equations, ε_{isc} and ε_{isct}, respectively, are error terms composed of a person-specific idiosyncratic shock and any unobservable sector-country (sector-country-year) fixed effects. We cluster the standard errors by country to allow for arbitrary within-country correlations in the errors. In terms of the parameter estimates on gender, the estimate of β_1 is the causal impact of being female on access to credit or on the terms of granted loans, respectively.

Next, we evaluate the effect of gender on credit market outcomes accounting for gender bias. For simplicity of illustration, yet without loss of generality, assume that countries can be divided into those with a high gender bias and those where society does not derive disutility from treating females as equal to males. We create a dummy variable equal to 1 if the US descendants of emigrants from the respective country have a higher gender bias than the US descendants of emigrants from the reference country (Poland),

[8] In the case of our dummy variables for credit access, we employ a probit regression, but the results are robust to using a logit model.

and to 0 if they have a lower gender bias. Then, we modify the above equations in the following way:

$$Credit\_access_{isc} = \beta_1 Female_{isc} \cdot Bias_c + \beta_2 Female_{isc} + \beta_3 X_{isc} + \beta_4 \Delta_{sc} + \varepsilon_{isc} \qquad (3)$$

and

$$Loan\_term_{isct} = \beta_1 Female_{isc} \cdot Bias_c + \beta_2 Female_{isct} + \beta_3 X_{isc} + \beta_4 Y_{sc} + \beta_5 \Delta_{sct} + \varepsilon_{isct} \quad (4)$$

In these specifications, β_2 measures the causal impact of being female on access to credit or on the terms of granted loans, respectively, and $\beta_1 + \beta_2$ measures the effect of being female on credit market outcomes or on the terms of granted loans in countries with high gender bias. The direct effect of gender bias, which is common to everyone in the respective group of countries, is subsumed in the country fixed effects.

4. Results

A. Gender and credit market outcomes

We now turn to the correlation between gender and credit market outcomes. This is a first step in our analysis necessary to establish whether banks indeed discriminate against female firm owners, as in Hertz (2011) and Muravyev, Schäfer, and Talavera (2012) for example.

A.1. Gender and credit access

We first investigate the determinants of credit access. Table 6 reports the empirical estimates from Model (1). We first focus on the sources of financing of working capital. We focus on bank credit and on trade credit. Theoretical work on the pecking order in corporate finance suggests that firms prefer credit from banks to credit from suppliers/consumers because of its lower price (e.g., Petersen and Rajan, 1997). We make two salient assumptions, i.e., that female firm-owners have the same preferences over the pecking order and that they face the same probability of success when applying

for trade credit. Then, female owners having relatively lower access to cheaper bank credit and having to rely relatively more on more expensive trade credit would be one manifestation of taste-based discrimination.

< Insert Table 6 here >

Column (1) investigates the determinants of bank credit finance and column (2) the determinants of trade credit finance. Consistent with prior literature, all else equal, small firms and sole proprietorships are more credit constrained, potentially indicating a lower ability to tap alternative capital markets; firms that export part of their production are less constrained in terms of both types of finance, potentially signalling the willingness of banks and customers/suppliers to lend to firms with higher growth prospects; and audited firms are less credit constrained, implying gains from the reduction of informational opacity in terms of credit market access.

Turning to our primary variable of interest, we find that firms with female owners finance a strictly lower share of their capital expenses with bank credit, and a strictly higher share of their capital expenses with trade credit. Being female results in a 3 percentage points lower share of working capital financed with bank credit. Numerically, this corresponds to 12 percent of the sample standard deviation of this variable. Likewise, being female results in a 1 percentage point lower share of working capital being financed with bank credit, which corresponds to 5 percent of the sample standard deviation. One way to think about the economic significance of these results is that a male owner of a firm which does not have its financial accounts certified by an external auditor will finance a larger share of its working capital with bank credit than a female owner of a fully transparent firm. This example suggests that the effect of being female on credit market access is not simply negative, but also sizeable.

In the next two columns, we investigate the determinants of being completely shut out of credit markets, either because the firm was discouraged from applying (column (3)) or because it applied but its application was rejected (column (4)). We confirm the sign of the firm covariates, namely, small firms are both rejected and discouraged more

often, while exporters and audited firms are less often credit constrained. Importantly, we also confirm our previous results in terms of gender inequality. In particular, female-owned firms have a higher probability of not applying for a loan because they were discouraged (column (3)), although this effect is not significant. Out of firms that actually apply for a loan, ceteris paribus, female-owned ones have a statistically higher probability of having their loan application rejected by the banks. In terms of the marginal effect, a firm at the sample mean has a 2 percentage points higher probability of having its application rejected if it is female-owned.

A.2. Gender and loan terms

Next, we turn to the determinants of the terms on granted loans. As in Alesina, Lotti, and Mistrulli (2013) we now test, for example, the hypothesis that banks do not price discriminate against females. However, we go beyond previous studies in that in addition to loan rates, we look at the effect of gender on the time it takes to negotiate the loan, on the loan's collateral, and on its currency denomination.

<Insert Table 7 here >

For a start, we find that the variables which matter for credit access (as in Table 6) also have an impact on the terms of granted loans. In particular, small firms pay higher rates on bank loans (column (5)), albeit with higher probability these loans are not collateralized. On the contrary, exporters are charged lower rates by their bank, they are more often given loans in a foreign currency (column (4)), and they take a shorter time to negotiate the loan (column (1)). In terms of the time-varying country-level variables, banks in countries with higher foreign ownership of banks and with superior creditors' rights take less time to negotiate a loan (column (1)), and in countries with deeper financial markets and with broader information sharing, firms have a higher probability of obtaining a non-collateralized loan.

Turning to our main variable of interest, we find that gender matters only for the speed with which the bank grants a loan. In particular, female-owned firms obtain a loan

in 2 days less than male-owned firms (given a sample average of 19.5 days). Therefore, we find no evidence that banks discriminate against females by screening them longer than identical male-owned firms. In terms of the other loan terms, we also find no evidence of discrimination: Females actually have a higher chance of obtaining an un-collateralized loan (column (1)) and pay lower rates (column (5)); however, these effects are not significant in a statistical sense.

We conclude that our data provides some evidence of discrimination against female firm owners, but only in terms of credit access: Female-owned firms are more often discouraged from applying for a bank loan, and are more often rejected once they do, with the effect being strongly significant in the first case. Such firms also end up using less bank credit and more trade credit. However, for firms that ultimately do obtain a loan, we find no discrimination against female owners in terms of a wide range of loan terms.

B. Inherited cultural bias, gender, and credit market outcomes

We now turn to the correlation between gender bias, gender, and credit market outcomes. The idea of this section is to establish whether bankers' decisions to ration female-owned firms that are similar to male-owned firms in terms of creditworthiness are driven by a gender bias.

B.1. Inherited cultural bias, gender, and credit access

In order to investigating the impact of the inherited cultural bias on credit access and on loan terms for female firm-owners, we now include an interaction term of Gender bias with Female owner. We expect the estimated coefficients to indicate that stronger gender bias worsens credit access and loan terms for females. The estimates in Table 8 broadly confirm this prior. For example the estimated coefficient on the interaction term in column (1) indicates that a stronger gender bias in the country moderately (though not statistically significantly) decreases the share of working capital that is financed with bank credit in firms with female owners. But the estimate in column (2) implies that a

strong bias sharply (and statistically significantly) increases the share financed with trade credit. In the latter case the estimated coefficient implies that if a firm with a female owner would move from Ireland to Serbia, for example, trade credit financing would increase by 2.3 percentage points more than if the owner of the firms was a male. This is a very large additional increase given that the share at the mean firm in the sample is only 6 percent.

< Insert Table 8 here >

Column (3) shows that female owners are also more discouraged applying for a loan in countries with a wide gender bias. Again moving from Ireland to Serbia increases discouragement by female owners by 14 percentage points more than male owners, sizeable given that the mean probability of discouragement across all firms is 23 percent.[9] Finally, the estimate of the coefficient on the interaction term in column (4), though not statistically significant, is also economically relevant.

B.1. Inherited cultural bias, gender, and loan terms

Next we assess if the inherited cultural bias has an impact on the loan terms firms with female owners obtain (versus firms owned by males). In contrast to our findings on credit access, the estimated coefficients on the interaction term of the Gender bias and the Female owner dummy is statistically insignificant in all but one case when a loan term is the dependent variable. This finding corresponds to the lack of explanatory power of the Female owner dummy in explaining loan terms.

< Insert Table 9 here >

[9] Female owners in strong gender bias countries may be discouraged from applying for a loan, not because they correctly anticipate rejection due to taste-based discrimination, but because they "internalize" the gender bias and feel less confident applying *per se*. As obtaining trade credit is also often a matter of requesting and negotiating it (yet we observe trade credit to increase) we do not think such a lack of confidence necessarily applies to the female owners in our sample.

C. Gender and firm performance

The results so far indicate that access to credit is far more problematic for female than for male firm-owners, especially in countries where the gender bias is strong. Loan terms on the other hand are not different between female- and male-owned firms. These findings suggest taste-based gender discrimination that solely limits access. Once access to credit through a non-discriminatory loan officer is possible, potentially because the loan officer herself is a female (Beck, Behr, and Madestam, 2012), similar loan terms suggest that female-owned firms are deemed to be similar to male-owned firms.

To further investigate this point, i.e., that it is not some unobserved firm characteristic such as owner expected future performance correlated with gender, that is reflected in credit access, we analyse the difference in firm growth across gender and across gender bias. For example, women may be more risk-averse (Powel and Ansic, 1997; Jianakoplos and Bernasek, 1998), although more recent experimental evidence has suggested that gender-specific risk behaviour may be due to differences in opportunity sets rather than risk attitudes (Schubert, Brown, Gysler, and Brachniger, 1999).

We first regress the logarithm of realised firm sales growth in the past three years on all firm-level characteristics in Table 6 (with the exception of *Female*), as well as the industry and country dummies. Then we subtract the logarithm of sales growth predicted by this regression from actual sales growth. The resulting variable, *Residual log sales growth*, should capture the portion of firm growth that is explained by gender and by access to credit. Then, we compare, in a simple two-sided Mann-Whitney *t*-test, the average *Residual log sales growth* between gender groups and across countries with low and high gender bias.

< Insert Table 10 here >

Table 10 implies that in low gender bias countries (i.e., where inherited gender bias is below Poland's), banks are efficient in screening applicants of both genders (Panel A). Both female-owned and male-owned firms grow faster, in terms of sales, if they have

access to bank credit compared with identical firms that are credit constrained. The difference is significant at the 10 percent level in both cases. However, in high gender bias countries (Panel B), there is no statistical difference between in the growth rates of constrained versus unconstrained firms, implying that banks are relatively more inefficient in screening potential borrowers. In fact, constrained female-owned firms actually grow faster than unconstrained female-owned firms, although not statistically so.

An even stricter test is to compare the sales growth of *male-owned firms* that are *unconstrained* in their credit access to *female-owned firms* that are *constrained*, and to do so this in *high gender bias countries* where also in other areas of economic activity female-owned firms may be discriminated against. We do so in Panel C. We find that, despite both these hurdles for female-owned firms, the sales growth rate of constrained female-owned and unconstrained male-owned firms are not statistically different (3.8 versus 1.5 percent). This test strongly suggests that the results we document in Table 8 in countries with a high gender bias are driven by a reluctance to extend credit to females, rather than by the fact that females have lower entrepreneurial ability and banks correctly anticipate this.

5. Conclusion

We analyse differential credit access and terms across 17 countries for female- versus male-owned using responses from 5,905 small family firms in the 2004/2005 wave of the Business Environment and Enterprise Performance Survey (BEEPS). We find that firms owned by females have more difficulties obtaining credit than otherwise similar firms owned by males but that once credit is obtained loan terms are not different. The differential access to credit to the females' disadvantage is exacerbated in countries where the inherited cultural gender bias is severe. In addition, the female-owned firms do not underperform male-owned firms in terms of sales growth, even when not obtaining credit or when based in high gender-bias countries.

In sum, these findings suggest taste-based gender discrimination that limits access to credit to firms owned by females. Once access to credit through a non-discriminatory bank is possible, similar loan terms suggest female-owned firms are assessed to be similar to male-owned firms, and this assessment is correct because their sales growth also turns out to be the same. This also suggests that the discrimination is random, i.e., it is not the case that loan officers select only the best female-owned firms while lending also to mediocre male-owned firms.

The contribution of our paper therefore consists in linking the severity of the inherited cultural gender bias as it exists across countries to specific outcomes in the credit market, in particular credit access. All results are consistent with random gender discrimination. Policies in strong bias countries that enable and facilitate lending to female-owned firms are therefore called for and in particular and beyond doubt will enhance overall firm performance. One possibility could be to stimulate banks to recruit and train female loan officers (Beck, Behr, and Guettler, 2013) that may be less subject to a gender bias. Alternatively, banks could be incentivized over some time period by subsidies to lend to deserving female-owned firms that now are for no good reason denied access to credit.

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Table 1. Credit access, by country

Country	# firms	Share working capital financed with bank credit	Share working capital financed with trade credit	Firm discouraged from applying for a loan	Loan application rejected
Bosnia	141	0.18	0.04	0.17	0.01
Croatia	141	0.15	0.06	0.10	0.02
Czech Republic	253	0.07	0.06	0.36	0.16
Germany	778	0.13	0.11	0.10	0.08
Greece	498	0.10	0.12	0.11	0.01
Hungary	462	0.12	0.05	0.25	0.03
Ireland	395	0.24	0.09	0.02	0.02
Lithuania	141	0.10	0.13	0.24	0.05
Macedonia	153	0.04	0.06	0.53	0.04
Poland	763	0.06	0.04	0.42	0.09
Portugal	370	0.08	0.04	0.31	0.03
Romania	393	0.12	0.06	0.25	0.12
Russia	434	0.04	0.07	0.42	0.08
Slovakia	142	0.06	0.02	0.15	0.03
Slovenia	132	0.15	0.03	0.08	0.01
Spain	501	0.12	0.00	0.14	0.02
Yugoslavia	208	0.08	0.05	0.39	0.03
Total	5,905	0.11	0.06	0.23	0.05

Note: This table presents statistics on firm credit access, by country. *Share working capital financed with bank credit* is the proportion of the firm's working capital that has been financed by borrowing from private commercial banks in the past 12 months. *Share working capital financed with trade credit* is the proportion of the firm's working capital that has been financed with trade credit from suppliers or customers in the past 12 months. *Firm discouraged from applying for a loan* is a dummy equal to 1 if the firm did not apply for a bank loan because it thought it felt discouraged by credit market conditions, and equal to 0 otherwise (all dummies will have these two values; so the "equal to 0 otherwise" will no longer be included below). *Loan application rejected* is a dummy equal to 1 if the firm applied for credit and had its loan application rejected. See Appendix for variable definitions and data sources.

Table 2. Loan-level variables

Country	Days to negotiate loan	Loan not collateralized	Collateral as % of loan	Loan in foreign currency	Annualized loan rate
Bosnia	18.48	0.05	203.48	0.01	10.30
Croatia	27.02	0.25	160.36	0.29	8.13
Czech Republic	32.91	0.18	122.20	0.03	10.04
Germany	18.72	0.06	123.69	0.02	7.74
Greece	17.42	0.44	132.72	0.04	7.35
Hungary	22.53	0.06	168.04	0.21	13.22
Ireland	16.12	0.37	158.22	0.02	4.74
Lithuania	27.30	0.19	135.15	0.33	5.93
Macedonia	22.00	0.05	198.05	0.45	11.37
Poland	22.77	0.20	153.18	0.12	13.06
Portugal	10.99	0.41	120.12	0.00	7.02
Romania	21.21	0.06	153.12	0.38	17.94
Russia	19.80	0.11	148.91	0.13	18.07
Slovakia	35.67	0.23	144.31	0.02	8.07
Slovenia	14.22	0.44	157.24	0.22	6.48
Spain	8.22	0.28	134.79	0.01	6.51
Yugoslavia	22.40	0.07	193.36	0.17	13.66
Total	19.52	0.20	148.85	0.11	9.85

Note: This table presents statistics on firm financing, by country. *Days to negotiate loan* is the number of days it took to negotiate the loan with the bank from the day of application. *Loan not collateralized* is a dummy equal to 1 if the financing of the loan did not require collateral. *Collateral as % of loan* is the value of the collateral required as a percentage of the loan value. *Loan in foreign currency* is a dummy equal to 1 if the loan is denominated in foreign currency. *Annualized loan rate* is the loan's annual rate of interest. See Appendix for variable definitions and data sources.

Table 3. Firm-level explanatory variables

Country	Female owner	Small firm	Large firm	Originally private	Exporter	Competition	Subsidized	Audited
Bosnia	0.26	0.67	0.04	0.83	0.32	0.62	0.01	0.45
Croatia	0.20	0.82	0.06	0.80	0.30	0.51	0.15	0.35
Czech Republic	0.22	0.87	0.03	0.92	0.22	0.45	0.06	0.27
Germany	0.20	0.85	0.06	0.99	0.13	0.00	0.13	0.47
Greece	0.25	0.83	0.06	0.99	0.17	0.00	0.09	0.46
Hungary	0.40	0.81	0.02	0.88	0.31	0.65	0.15	0.70
Ireland	0.41	0.86	0.03	0.99	0.29	0.58	0.08	0.94
Lithuania	0.26	0.74	0.04	0.79	0.32	0.64	0.06	0.36
Macedonia	0.18	0.82	0.06	0.84	0.27	0.65	0.02	0.24
Poland	0.34	0.87	0.02	0.95	0.21	0.65	0.08	0.30
Portugal	0.50	0.91	0.04	0.99	0.10	0.00	0.04	0.74
Romania	0.28	0.72	0.04	0.85	0.20	0.41	0.05	0.35
Russia	0.28	0.75	0.07	0.86	0.13	0.22	0.01	0.35
Slovakia	0.18	0.80	0.03	0.93	0.27	0.82	0.06	0.43
Slovenia	0.35	0.92	0.02	0.86	0.42	0.68	0.10	0.20
Spain	0.19	0.88	0.06	0.97	0.14	0.00	0.03	0.27
Yugoslavia	0.25	0.82	0.06	0.89	0.25	0.56	0.05	0.24
Total	0.29	0.83	0.04	0.93	0.21	0.35	0.08	0.44

Note: This table presents firm-level statistics, by country. All firms in the final sample are individually owned or family-owned. *Female owner* is a dummy equal to 1 if the principal owner (or one of the principal owners) is a female. *Small firm* is a dummy equal to 1 if the firm has less than 20 employees. *Large firm* is a dummy equal to 1 if the firm has more than 100 employees. *Originally private* is a dummy equal to 1 if the firm was founded as a private company rather than through privatization of a previously state-owned one. *Exporter* is a dummy equal to 1 if the firm has access to foreign markets. *Competition* is a dummy equal to 1 if the firm faces "fairly", "very", or "extremely" strong competition. *Subsidized* is a dummy equal to 1 if the firm has received subsidies during the last 3 years from the central or local government. *Audited* is a dummy equal to 1 if the firm employs external auditing services. Omitted category for firm size is *Medium firm*. See Appendix for variable definitions and data sources.

Table 4. Country-level explanatory variables

	Gender bias	Foreign bank share	Private credit to GDP	Bank concentration	Information sharing	GDP per capita	GDP growth	Creditors' rights	Contract enforcement	Inflation
Bosnia	0.171	0.81	16.38	0.53	0.74	8.46	1.17	3.29	6.83	2.82
Croatia	0.171	0.91	50.73	0.63	0.00	9.36	3.06	4.18	5.61	3.77
Czech Republic	-0.058	0.85	32.00	0.60	1.92	9.85	1.78	7.00	6.63	2.59
Germany	-0.042	0.06	115.44	0.68	6.00	10.28	0.62	8.00	4.03	1.50
Greece	0.037	0.23	59.16	0.93	4.00	10.06	4.58	3.00	8.19	3.23
Hungary	0.084	0.71	40.34	0.65	4.04	9.65	1.98	7.00	3.35	5.23
Ireland	-0.076	0.36	125.52	0.56	5.00	10.51	4.40	8.00	5.15	2.90
Lithuania	-0.056	0.90	22.48	0.78	3.00	9.36	3.28	5.00	2.10	1.91
Macedonia	0.171	0.47	19.39	0.79	2.05	8.76	0.93	7.00	5.21	1.51
Poland	0.000	0.72	26.92	0.59	2.76	9.44	1.80	8.00	9.98	3.24
Portugal	-0.033	0.26	137.24	0.88	4.00	9.88	-0.39	3.00	5.77	3.03
Romania	0.085	0.57	13.04	0.64	3.88	8.96	3.02	7.00	5.37	17.36
Russia	-0.054	0.08	19.86	0.22	0.00	9.34	3.38	3.00	2.81	19.26
Slovakia	-0.058	0.92	33.35	0.83	2.81	9.61	1.85	9.00	6.02	4.91
Slovenia	0.171	0.20	43.97	0.67	2.90	9.98	1.93	5.00	14.25	3.99
Spain	0.064	0.11	108.62	0.87	5.00	10.22	3.12	6.00	5.15	3.10
Yugoslavia	0.171	0.44	19.37	------	0.00	8.64	2.15	7.00	9.40	14.43
Total	0.024	0.42	61.85	0.67	3.43	9.71	2.28	6.16	6.04	5.59

Note: The table summarizes various country-level characteristics used in the empirical analysis. *Gender bias* is the inherited gender bias by U.S. descendants of European immigrants (see Table 5 for details). *Foreign bank share* denotes the assets held by all foreign banks as a share of the assets of all commercial banks. *Private credit to GDP* denotes the ratio of private credit by deposit money banks and other financial institutions to GDP. *Bank concentration* denotes the assets held by the three largest banks as a share of the assets of all commercial banks. *Information sharing* denotes the maximum of an index for private credit bureaus and an index for public credit registers. *GDP per capita* denotes gross domestic product per capita, average over the past three years. *GDP growth* denotes annual growth in gross domestic product per capita, average over the past three years. *Creditors' rights* denotes the degree of protection of creditors' rights. *Contract enforcement* denotes the number of days it takes to enforce a legal contract. *Inflation* denotes annual inflation, averaged over the past three years. See Appendix for variable definitions and data sources.

Table 5. Country of origin and inherited gender bias

	Inherited gender bias	
	Coefficient	Standard error
	(1)	(2)
Demographic characteristics		
Age	0.003*	(0.002)
Age squared	0.000	(0.000)
Education	-0.029***	(0.002)
Male	0.097***	(0.011)
Catholic	0.101***	(0.017)
Protestant	0.140***	(0.016)
Employed	-0.100***	(0.015)
Unemployed	-0.082***	(0.029)
Income category	-0.008***	(0.003)
Country of origin		
Czechoslovakia	-0.058*	(0.036)
Germany	-0.042*	(0.022)
Greece	0.037	(0.054)
Hungary	0.084*	(0.052)
Ireland	-0.078***	(0.023)
Lithuania	-0.056	(0.069)
Portugal	-0.033	(0.061)
Romania	0.085*	(0.050)
Russia	-0.054*	(0.032)
Spain	0.064*	(0.037)
Yugoslavia	0.171**	(0.085)
Observations	6,472	
R-squared	0.18	

Note: The dependent variable is the inherited gender bias inherited by US immigrants from the period 1935-2000. *Inherited gender bias* is measured from the answer to the question: "*It is much better for everyone involved if the man is the achiever outside the home and the woman takes care of the home and family*." The answers are given on a scale from 1 to 4, which correspond to "Strongly agree," "Agree," "Disagree," and "Strongly disagree." The gender bias indicator is equal to 1 if the respondent agrees or strongly agrees, and equal to 0 if the respondent disagrees or strongly disagrees. The reference group in religion is "Muslim, Hindu, native-American, Christian-orthodox, Judaist, and other". The reference group in employment is "Inactive". Data come from the General Social Survey. White (1980) robust standard errors, clustered at the country level, are reported in parentheses, where *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 6. Gender and credit market access

	Share working capital financed with bank credit	Share working capital financed with trade credit	Firm discouraged from applying for a loan	Loan application rejected
	(1)	(2)	(3)	(4)
Female owner	-0.028***	0.010*	0.016	0.020*
	(0.004)	(0.005)	(0.015)	(0.011)
Small firm	-0.043**	-0.010	0.131***	0.018**
	(0.016)	(0.011)	(0.026)	(0.008)
Large firm	0.028	0.014	0.023	-0.004
	(0.020)	(0.020)	(0.028)	(0.011)
Originally private	0.029**	-0.006	0.012	-0.004
	(0.013)	(0.011)	(0.024)	(0.016)
Exporter	0.028**	0.019***	-0.068***	-0.021*
	(0.013)	(0.005)	(0.023)	(0.010)
Competition	0.023**	0.006	-0.034	-0.019*
	(0.010)	(0.006)	(0.032)	(0.009)
Subsidized	0.064***	0.012	-0.106***	-0.033***
	(0.020)	(0.011)	(0.033)	(0.007)
Audited	0.022***	-0.023	-0.074**	-0.025*
	(0.007)	(0.014)	(0.031)	(0.013)
Fixed effects		Country Industry		
Observations	5,307	5,307	3,113	2,526
R-squared	0.09	0.06	0.19	0.05

Note: This table presents regression results of indicators of credit market experience by firms on firm-level characteristics. All firms in the final sample are individually owned or family owned. The dependent variable is *Share working capital financed with bank credit* (column (1)), *Share working capital financed with trade credit* (column (2)), *Firm discouraged from applying for a loan* (column (3)), and *Loan application rejected* (column (4)). *Female owner* is a dummy equal to 1 if the principal owner (or one of the principal owners) is a female. *Small firm* is a dummy equal to 1 if the firm has less than 20 employees. *Large firm* is a dummy equal to 1 if the firm has more than 100 employees. *Originally private* is a dummy equal to 1 if the firm was founded as a private company rather than privatized. *Exporter* is a dummy equal to 1 if the firm does not have access to foreign markets. *Competition* is a dummy equal to 1 if the firm faces fairly, very, or extremely strong competition. *Subsidized* is a dummy equal to 1 if the firm has received subsidies during the last 3 years from the central or local government. *Audited* is a dummy equal to 1 if the firm employs external auditing services. Omitted category for firm size is *Medium firm*. See Appendix for variable definitions and data sources. All regressions include fixed effects as specified. White (1980) robust standard errors, clustered at the country level, are reported in parentheses, where *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 7. Gender and loan terms

	Log days to negotiate loan	Loan not collateralized	Log collateral as % of loan	Loan in foreign currency	Annualized loan rate
	(1)	(2)	(3)	(4)	(5)
Female owner	-0.084*	0.016	-0.018	-0.028	-0.107
	(0.050)	(0.016)	(0.019)	(0.018)	(0.151)
Small firm	-0.216***	0.047*	0.023	0.001	0.731***
	(0.068)	(0.025)	(0.029)	(0.024)	(0.214)
Large firm	0.106	0.017	0.010	0.041	-0.757
	(0.123)	(0.027)	(0.049)	(0.036)	(0.447)
Originally private	0.013	-0.039	0.031	0.020	0.005
	(0.106)	(0.025)	(0.037)	(0.038)	(0.347)
Exporter	-0.092*	-0.005	0.037	0.063***	-0.819**
	(0.046)	(0.024)	(0.033)	(0.018)	(0.362)
Competition	-0.034	-0.042	0.039*	0.010	0.256
	(0.052)	(0.035)	(0.019)	(0.012)	(0.338)
Subsidized	0.130**	-0.032	-0.032*	-0.061**	-0.181
	(0.046)	(0.035)	(0.016)	(0.022)	(0.408)
Audited	-0.015	0.020	-0.019	0.017	0.037
	(0.062)	(0.024)	(0.032)	(0.020)	(0.298)
Foreign bank share	-0.540	-0.024	-0.166	0.093	-3.637
	(0.418)	(0.126)	(0.123)	(0.116)	(4.703)
Private credit to GDP	-0.001	0.002	0.004**	0.001	0.040
	(0.005)	(0.001)	(0.001)	(0.001)	(0.037)
Bank concentration	0.204	0.021	-0.124	0.071	0.272
	(0.485)	(0.175)	(0.157)	(0.125)	(2.018)
Information sharing	0.078*	0.004	0.027*	0.012	-0.050
	(0.038)	(0.009)	(0.015)	(0.010)	(0.155)
Log GDP per capita	-0.267	0.034	-0.278	-0.490**	0.301
	(0.691)	(0.174)	(0.283)	(0.221)	(3.491)
GDP growth	0.028	0.002	0.017*	0.001	-0.052
	(0.025)	(0.008)	(0.008)	(0.006)	(0.093)
Creditors' rights	-0.170**	0.003	-0.046	-0.035	0.651
	(0.076)	(0.019)	(0.040)	(0.028)	(0.728)
Contract enforcement	0.154**	0.007	-0.026	-0.009	-0.533
	(0.064)	(0.032)	(0.037)	(0.016)	(0.351)
Inflation	-0.004	0.001	0.006	-0.002	0.065
	(0.007)	(0.002)	(0.003)	(0.003)	(0.069)
Fixed effects			Country Industry Year		
Observations	2,158	2,199	1,708	2,189	2,119
R-squared	0.15	0.14	0.10	0.17	0.57

Note: This table presents regression results of loan terms on firm-level and country-level characteristics. All firms in the final sample are individually owned or family owned. The dependent variable is the logarithm of *Days to negotiate loan* (column (1)), *Loan not collateralized* (column (2)), the logarithm of *Collateral as % of loan* (column (3)), *Loan in foreign currency* (column (4)), and *Nominal interest rate* (column (5)). *Female owner* is a dummy equal to 1 if the principal owner (or one of the principal owners) is a female. *Small firm* is a dummy equal to 1 if the firm has less than 20 employees. *Large firm* is a dummy equal to 1 if the firm has more than 100 employees. *Originally private* is a dummy equal to 1 if the firm was founded as a private company rather than privatized. *Exporter* is a dummy equal to 1 if the firm does not have access to foreign markets. *Competition* is a dummy equal to 1 if the firm faces fairly, very, or extremely strong competition. *Subsidized* is a dummy equal to 1 if the firm has received subsidies during the last 3 years from the central or local government. *Audited* is a dummy equal to 1 if the firm employs external auditing services. Omitted category for firm size is *Medium firm*. *Foreign*

bank share denotes the assets held by all foreign banks as a share of the assets of all commercial banks. *Private credit to GDP* denotes the ratio of private credit by deposit money banks and other financial institutions to GDP. *Bank concentration* denotes the assets held by the three largest banks as a share of the assets of all commercial banks. *Information sharing* denotes the maximum of an index for private credit bureaus and an index for public credit registers. *GDP per capita* denotes gross domestic product per capita, average over the past three years. *GDP growth* denotes annual growth in gross domestic product per capita, average over the past three years. *Creditors' rights* denotes the degree of protection of creditors' rights. *Contract enforcement* denotes the number of days it takes to enforce a legal contract. *Inflation* denotes annual inflation, averaged over the past three years. See Appendix for variable definitions and data sources. All regressions include fixed effects as specified. White (1980) robust standard errors, clustered at the country level, are reported in parentheses, where *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 8. Gender, culture, and credit market access

	Share working capital financed with bank credit	Share working capital financed with trade credit	Firm discouraged from applying for a loan	Loan application rejected
	(1)	(2)	(3)	(4)
Gender bias × Female owner	-0.009	0.024***	0.166**	0.073
	(0.009)	(0.009)	(0.087)	(0.174)
Female owner	-0.024***	-0.001	-0.026	0.153
	(0.006)	(0.006)	(0.057)	(0.128)
Firm controls		Yes		
Fixed effects		Country Industry		
Observations	5,307	5,307	3,113	2,526
R-squared	0.09	0.06	0.20	0.12

Note: This table presents regression results of indicators of credit market experience by firms on firm-level characteristics. All firms in the final sample are individually owned or family owned. The dependent variable is *Share working capital financed with bank credit* (column (1)), *Share working capital financed with trade credit* (column (2)), *Firm discouraged from applying for a loan* (column (3)), and *Loan application rejected* (column (4)). *Gender bias* is the country-level inherited gender bias estimated in Table 5. *Female owner* is a dummy equal to 1 if the principal owner (or one of the principal owners) is a female. All other variables from Table 6 are included in the regressions (coefficients are not reported for brevity). See Appendix for variable definitions and data sources. All regressions include fixed effects as specified. White (1980) robust standard errors, clustered at the country level, are reported in parentheses, where *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 9. Gender, culture, and loan terms

	Log days to negotiate loan	Loan not collateralized	Log collateral as % of loan	Loan in foreign currency	Nominal interest rate
	(1)	(2)	(3)	(4)	(5)
Gender bias × Female owner	0.026	-0.054	-0.054	0.428*	-0.257
	(0.101)	(0.140)	(0.037)	(0.236)	(0.242)
Female owner	-0.095	0.070	0.006	-0.435*	0.002
	(0.078)	(0.072)	(0.018)	(0.228)	(0.170)
Firm controls			Yes		
Fixed effects			Country		
			Industry		
			Year		
Observations	2,158	2,199	1,708	2,114	2,119
R-squared	0.15	0.15	0.10	0.23	0.57

Note: This table presents regression results of loan terms on firm-level and country-level characteristics. All firms in the final sample are individually owned or family owned. The dependent variable is the logarithm of *Days to negotiate loan* (column (1)), *Loan not collateralized (*column (2)), the logarithm of *Collateral as % of loan* (column (3)), *Loan in foreign currency* (column (4)), and *Nominal interest rate* (column (5)). *Gender bias* is the country-level inherited gender bias estimated in Table 5. *Female owner* is a dummy equal to 1 if the principal owner (or one of the principal owners) is a female. All other variables from Table 7 are included in the regressions (coefficients are not reported for brevity). See Appendix for variable definitions and data sources. All regressions include fixed effects as specified. White (1980) robust standard errors, clustered at the country level, are reported in parentheses, where *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 10. Culture, gender, credit, and firm performance

Panel A. Low gender bias countries

	Residual log sales growth		
	Constrained = 0	Constrained = 1	Difference
Male-owned firms	0.022	-0.060	0.082*
Female-owned firms	0.141	0.011	0.130*
Difference	-0.119*	-0.071	-0.052

Panel B. High gender bias countries

	Residual log sales growth		
	Constrained = 0	Constrained = 1	Difference
Male-owned firms	0.038	0.032	0.006
Female-owned firms	-0.073	0.015	-0.088
Difference	0.111*	0.018	0.093*

Panel C. High gender bias countries

	Residual log sales growth		
	Unconstrained male-owned firms	Constrained female-owned firms	Difference
	0.038	0.015	0.023

Note: The table presents the results from a two-sided Mann-Whitney t-test of the difference in firm performance which is not predicted by firm-level characteristics. All firms in the final sample are individually owned or family owned. The dependent variable, *Residual log sales growth*, is the difference between the logarithm of realised *Sales growth* in the past 3 years and the logarithm of *Sales growth* that is predicted by the firm-level characteristics in Table 6 (with the exception of *Female*) and the country and industry dummies. *Constrained* is a dummy equal to 1 if the firm applied for credit and had its loan application rejected, or if it was discouraged from applying by adverse credit market conditions. See Appendix for variable definitions and data sources. * indicates significance at the 10% level.

Appendix
Variables: Definitions and sources.

Variable Name	Definition	Source
	Firm characteristics	
Female	Dummy = 1 if the principal owner (or one of the principal owners) of the firm is a female.	BEEPS 2005
Small firm	Dummy = 1 if firm has less than 20 employees.	BEEPS 2005
Medium firm	Dummy = 1 if the firm has between 20 and 100 employees.	BEEPS 2005
Large firm	Dummy = 1 if firm has more than 100 employees.	BEEPS 2005
Originally private	Dummy = 1 if firm was founded as a private company rather than through privatization.	BEEPS 2005
Exporter	Dummy = 1 if the firm has access to foreign markets.	BEEPS 2005
Competition	Dummy = 1 if the firm faces fairly, very, or extremely strong competition.	BEEPS 2005
Subsidized	Dummy = 1 if the firm has received subsidies during the last 3 years from the central or local government.	BEEPS 2005
Audited	Dummy = 1 if the firm employs external auditing services.	BEEPS 2005
	Credit access	
Share working capital financed with bank credit	The proportion of the firm's working capital that has been financed by borrowing from private commercial banks in the past 12 months.	BEEPS 2005
Share working capital financed with trade credit	The proportion of the firm's working capital that has been financed with trade credit from suppliers or customers in the past 12 months.	BEEPS 2005
Firm discouraged from applying for a loan	Dummy = 1 if the firm did not apply for a bank loan because it was discouraged by adverse credit market conditions and to 0 otherwise. Self-reported reasons for discouragement include: (a) application procedures are too burdensome, (b) collateral requirements are too high, (c) interest rates are too high, (d) informal payments are necessary, or (e) the firm did not think their application would be approved.	BEEPS 2005
Loan application rejected	Dummy = 1 if the firm applied for credit and had its loan application rejected, and to 0 otherwise.	BEEPS 2005
	Loan terms	
Days to negotiate loan	The number of days it took to negotiate the loan with the bank from the day of application.	BEEPS 2005

Loan not collateralized	Dummy = 1 if the financing of the loan did not require collateral.	BEEPS 2005
Collateral as % of loan	The value of the collateral required as a percentage of the loan value.	BEEPS 2005
Loan in foreign currency	Dummy = 1 if the loan is denominated in foreign currency.	BEEPS 2005
Annualized loan rate	The loan's annual rate of interest.	BEEPS 2005
	Country variables	
Inherited gender bias	The inherited gender bias by U.S. descendants of European immigrants. It is measured from the answer to the question: "*It is much better for everyone involved if the man is the achiever outside the home and the woman takes care of the home and family*." The answers are given on a scale from 1 to 4, which corresponds to "Strongly agree," "Agree," "Disagree," and "Strongly disagree." The gender bias indicator is equal to 1 if the respondent agrees or strongly agrees, and to 0 if the respondent disagrees or strongly disagrees.	GSS
Foreign bank share	Assets held by all foreign banks as a share of the assets of all commercial banks.	EBRD TR
Private credit	The ratio of private credit by deposit money banks and other financial institutions to GDP.	WB FDSD
Bank concentration	The assets held by the three largest banks as a share of the assets of all commercial banks.	WB FDSD
Information sharing	The maximum of an index for private credit bureaus and an index for public credit registers.	WB DBD
GDP per capita	Gross domestic product per capita, average over the past three years.	PWT 6.3
GDP growth	Annual growth in gross domestic product per capita, average over the past three years.	PWT 6.3
Creditors' rights	Degree of protection of creditors' rights.	WB DBD
Contract enforcement	The number of days it takes to enforce a legal contract.	WB DBD
Inflation	Annual inflation, average over the past three years.	EBRD TR

Note: The Table uses the following sources: Business Environment and Enterprise Performance Survey (BEEPS), 2005; General Social Survey (GSS); European Bank for Reconstruction and Development Transition Report (2000-2005 EBRD TR); World Bank Financial Development and Structure Database by Thorsten Beck, Asli Demirguc-Kunt, and Vojislav Maksimovic, 2010 (WB FDSD); Penn World Tables (PWT 6.3); World Bank Doing Business database (WB DBD).